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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,232	11/26/2003	Rolf Freimann	861840 999018	5693

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EXAMINER
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TURNER, SAMUEL A

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/721,232	FREIMANN ET AL.	
	Examiner	Art Unit	
	Samuel A. Turner	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/25/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Title*

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 is confusing in that how does the aspherical lens provide a Fizeau lens ? This claim appears to claim that the aspherical lens is the Fizeau lens.

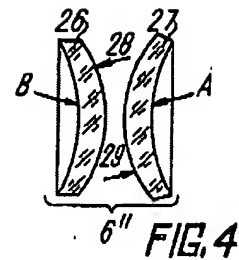
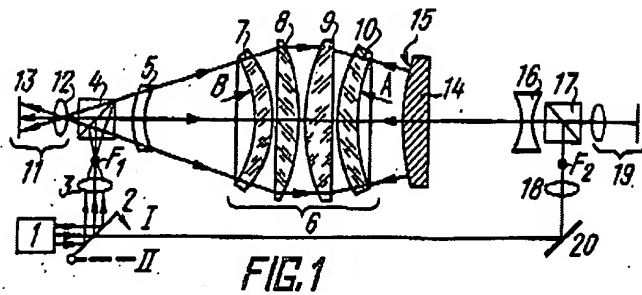
### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Puryaev(4,468,122).



With regard to claim 19, Puryaev teaches a method of processing an optical element having a spherical surface using light beams of a spherical beam type comprising:

providing a first interferometer apparatus (figure 1; column 3, lines 39-63) having an interferometer optics (26, 27), wherein the interferometer optics comprises an aspherical lens (26 or 27; column 4, lines 47-49) configured to transform a beam of a first spherical beam type (divergent) into a beam of a second spherical beam type (plane), the aspherical lens having at least one aspherical surface (28 or 29; column 4, lines 47-49);

arranging the optical element (14) in a beam path of an incident beam of a third spherical type (convergent) provided by the interferometer optics;

interferometrically taking a first measurement of first wave fronts generated by reflecting the incident beam from the spherical surface of the optical element (column 3, lines 64+); and

determining first deviations of the spherical surface of the optical element from a target shape thereof in dependence of the first measurement (column 5, lines 7-10).

Art Unit: 2877

The phrase “the at least one aspherical surface having been interferometrically measured using a beam of one of the first spherical beam type and the second spherical beam type to determine that second deviations of the least one aspherical surface from at least one corresponding target aspherical shape are less than a predetermined value” is a structural limitation that is directed to the aspherical lens and not the method for measuring the surface of the object. It has been held that to be entitled to weight in method claims, the recited structural limitations therein must affect the method in a manipulative sense, and not to amount to the mere claiming of a use of a particular structure. *Ex parte Pfeiffer*, 1962 C.D. 408 (1961).

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

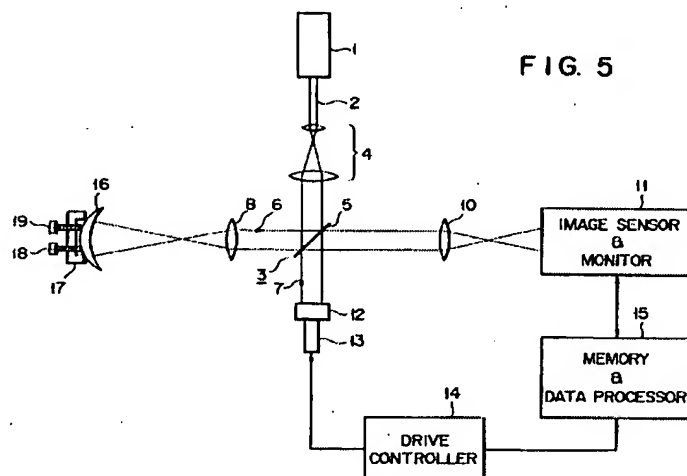
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35

Art Unit: 2877

U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 8, and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puryaev(4,468,122) in view of Ono(4,697,927).



With regard to claim 1 Puryaev teaches a method of processing an optical element having a spherical surface, the method using light beams of a spherical beam type, the spherical beam type including beams having one of substantially spherical wave fronts and substantially plane wave fronts, the method comprising:

providing a first interferometer apparatus (figure 1; column 3, lines 39-63) having an interferometer optics (26,27), wherein the interferometer optics comprises an aspherical lens (26 or 27; column 4, lines 47-49) configured to transform a beam of a first spherical beam type (divergent) into a beam of a second spherical beam type (plane), the aspherical lens having at least one aspherical surface (28 or 29; column 4, lines 47-49);

arranging the optical element(14) in a beam, path of an incident beam of a third spherical type(convergent) provided by the interferometer optics; interferometrically taking a first measurement of first wave fronts generated by reflecting the incident beam from the spherical surface of the optical element(column 3, lines 64+); and

determining first deviations of the spherical surface of the optical element from a target shape thereof in dependence of the first measurement(column 5, lines 7-10).

Puryaev does not teach any method for also inspecting the aspherical lens. Note that Puryaev is an interferometer optical system and would have optics of the highest quality for inspection in the wavelength range of the optical source. Thus it would have been inherent to the system to inspect each of the optics, including the aspherical lens, to obtain optics having minimum optical aberrations. Ono teaches a method of inspecting an aspherical lens comprises:

arranging the aspherical lens(16; column 8, lines 47+ and column 20, lines 46-54) in a beam path of a measuring beam(6) provided by a beam source(1) of a second interferometer apparatus(figure 5) such that the measuring beam passes the aspherical lens and is reflected from reflecting surface(plane mirror; column 5, lines 26-54), wherein the measuring beam, between the aspherical surface and the reflecting surface, is one of the first spherical type and the second spherical type(plane; column 20, lines 26-54);

interferometrically taking a second measurement of second wave fronts generated by reflecting the measuring beam from the reflecting surface(column 9, lines 18-23); and

determining second deviations of the at least one aspherical surface of the aspherical lens from a target shape thereof in dependence of the second measurement(column 16, line 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to teach the aspherical lens of Puryaev using the method of Ono in order to obtain optics of the highest quality.

As to claim 2, wherein the reflecting surface is provided on an optical element separate from the aspherical lens(A or B).

As to claim 3, wherein the reflecting surface is provided by a surface of the aspherical lens opposite to the at least one aspherical surface thereof(A or B), for reflecting the measuring beam having passed the aspherical surface of the aspherical lens.

As to claim 4. The method according to claim wherein the interferometer optics further comprises a Fizeau lens(26 or 27) having a concave substantially spherical surface(A or B) providing a Fizeau surface of the first interferometer apparatus.



As to claim 5, wherein the aspherical lens(26 or 27) provides the Fizeau lens, wherein the Fizeau surface is provided by a surface of the aspherical lens opposite to the aspherical surface(A or B).

As to claim 8, Puryaev fails to teach applying an anti-reflective coating to the aspherical surface of the aspherical lens.

Official notice is taken that the use of anti-reflection coatings on interferometer optics is well known in the art in order to minimize reflections at each lens surface. See In re Malcom, 1942 C.D 589; 543 O.G. 440.

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the next Office action will indicate that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply an anti-reflection coating on each lens surface where any reflection is not wanted, including the aspherical surface, in order to minimize reflections at each lens surface.

With regard to claims 12-14, Puryaev fails to teach any post measurement processing of the surface of the optical element.

The interferometer system of Puryaev is used to check the shape of optical components, optical components that are used in other optical instruments such as telescopes, microscopes, photo-lithographers, and imagers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

Art Unit: 2877

finish the optical element after inspection by adding various films including at least one of a reflective coating, an anti-reflective coating and a protective coating, in order to prepare the optical element for its intended use.

While Puryaev does teach inspecting the surface of the optical element in relation to both small and large D/R ratios, the reference is silent about specific values.

With regard to claims 15-18, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the interferometer optics to measure any optical element surface, including those with k-values(R/D) of 0.8-0.55.

Claims 6, 7, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puryaev(4,468,122) in view of Ono(4,697,927) as applied to claims 1-5, 8, and 12-18 above, and further in view of Ichihara(6,312,373).

Ichihara teaches that interferometers are used in the manufacturing of various optical elements which are ground measured and reground depending on the difference between the shape error and the desired optical shape( see figure 24 and columns 26, line 38-column 28, line 32). This includes repetitions of the measurement/grinding process( column 28, lines 22+).

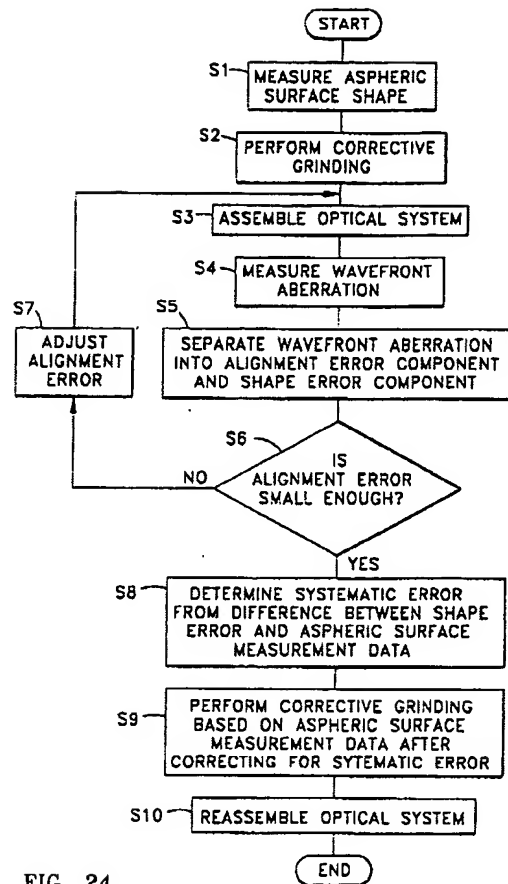


FIG. 24

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the grinding-measurement-grinding process to any surface including the aspherical lens measured by Ono, claims 6 and 7, or the spherical surface measured by Puryaev, claims 9-11.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Samuel A. Turner', with a stylized flourish at the end.

Samuel A. Turner  
Primary Examiner  
Art Unit 2877